

# **OFFICE OF AIR AND RADIATION OFFICE OF TRANSPORTATION AND AIR QUALITY**

## **FUEL ECONOMY PROGRAM**

### **Fact Sheet**

#### **I. FUEL ECONOMY LABELS AND FUEL ECONOMY GUIDE**

EPA and the Department of Energy each year publish the Fuel Economy Guide listing the fuel efficiencies (miles per gallon) of new passenger vehicles. The Fuel Economy Guide is published and distributed by the Department of Energy based on EPA data. Detailed information on vehicle fuel economy, including a downloadable version of the Fuel Economy Guide can be found at [www.fueleconomy.gov](http://www.fueleconomy.gov), a website maintained jointly by EPA and the Department of Energy.

#### **Vehicles Tested**

- Manufacturers are only required to test one vehicle in each base level (combination of inertia weight classes (250 to 500 pound increments)), transmission class (type of transmission such as Manual 4-speed), and basic engine (engine size, number of cylinders, and type of fuel system; such as: 5.0-liter, 8 cylinder, multi-point fuel injected engine).
- The required vehicle is chosen on the basis of highest sales projection.
- Manufacturers may test additional vehicles, if they choose.
- Manufacturers test all the vehicles at their laboratories. EPA confirms about 10-15 percent of the vehicles at the EPA lab.

#### **Types of Tests Run**

- Vehicles are driven over identical driving patterns by professional drivers in controlled laboratory on a dynamometer. Road forces and aerodynamic forces are fully accounted for in the test.
- There are two types of tests that are conducted: city and highway tests.
  - The city test is approximately 11 miles long and is a stop and go trip with an average speed of about 20 miles per hour (mph). The trip lasts 31 minutes and has 23 stops. About 18 percent of the time is spent idling (as in waiting for traffic lights). A short freeway driving segment is included in the test. The engine is initially started after being parked overnight.

- The highway is a 10 mile trip with an average speed of 48 mph. The vehicle is started "hot" and there is very little idling and no stops.

### **Calculation Technique**

- Fuel economy values are calculated from the emissions generated during the tests using a carbon balance equation (we know how much carbon is in the fuel, so by measuring the carbon compounds expelled in the exhaust we can calculate the fuel economy).
- Label values are calculated for different vehicle models by sales weighting the projected sales and fuel economy of one or more test vehicles.
- The equation for calculating the city or highway average mpg is:

$$FE_{ave} = (\text{total sales} / [(\text{sales}_1/FE_1) + (\text{sales}_2/FE_2) + \dots + (\text{sales}_n/FE_n)])$$

- Combined fuel economy is a harmonically weighted average of the city (55%) and highway (45%) fuel economy (mpg) values. The equation is:

$$FE_{comb} = 1 / ((.55 / \text{city FE}) + (.45 / \text{hwy FE}))$$

### **Fuel Economy Guide and Fuel Economy Label Values**

- The Guide and Label values are based on model type averages (combination of carline (vehicle names, such as: Escort), transmission class, and basic engine).
- The Guide and Label values are adjusted to account for the in-use shortfall of EPA numbers (EPA conducted a study and determined that real drivers in actual conditions get 90% of EPA's city value and 78% of EPA's highway value). The city value is multiplied by 0.90 and the highway value is multiplied by 0.78.
- Guide and Label values are rounded to a whole mile per gallon (MPG).
- Annual fuel costs shown in the Guide and on the Label are based on the combined fuel economy (adjusted for in-use shortfall), 15,000 miles traveled per year and the estimated fuel cost from the following table (for 2002 model year vehicles):

Regular Unleaded Gasoline	\$1.50 per gallon
Premium Unleaded Gasoline	\$1.65 per gallon
Diesel Fuel	\$1.45 per gallon
M85 Methanol Fuel	\$1.80 per gallon
CNG (Gasoline equivalent)	\$1.40 per gallon

E85 Ethanol Fuel	\$2.45 per gallon
LPG (Propane)	\$1.90 per gallon
Electricity	\$0.05, 0.10, 0.15 per kilowatt-hour

- The Fuel Economy Guide is published and distributed to dealerships in the U.S. by DOE based on EPA's data. It can also be found on the Internet at [www.fueleconomy.gov](http://www.fueleconomy.gov) (with updated information).
- Manufacturers are required to place a window sticker containing the city and highway fuel economy (mpg) values on all new cars and light trucks (less than 8500 pounds of gross vehicle weight rating (GVWR)) when they are offered for sale or lease.
- New car dealers are required to have copies of the Guide available.

## II. CORPORATE AVERAGE FUEL ECONOMY (CAFE)

Corporate Average Fuel Economy (CAFE) requires vehicle manufacturers to comply with the gas mileage, or fuel economy, standards set by the *Department of Transportation*. CAFE values are obtained by combining the city and highway fuel economy test results and computing an average which is weighted by vehicle sales. Tests are conducted in a laboratory by operating vehicles on a dynamometer. The Environmental Protection Agency administers the testing program which generates the fuel economy data and determines the procedures for calculating the fuel economy values for CAFE. The National Highway Traffic and Safety Administration (NHTSA), part of the Department of Transportation (DOT), is authorized to assess penalties based on the information EPA supplies and to modify the standards.

### Vehicles Tested

- All tests run for emission certification, running changes, and fuel economy labels are included in the calculation.
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- At the minimum the manufacturer must run sufficient vehicles to achieve 90 percent actual sales coverage by configuration.
- Manufacturers test all the vehicles at their laboratories. EPA confirms about 10 to 15 percent of the vehicles at the EPA lab.

### Calculation Technique

- Calculation is similar to labels except that actual production figures are used in place of projected sales.
- The CAFE is the actual sales-weighted average fuel economy of all models.

- The CAFE final average mpg value is adjusted to account for changes to the test procedures since the base year (1975).

### **Calculation Categories**

- Separate calculations are made for passenger cars and light-duty trucks. This includes all four-wheeled highway vehicles, except heavy-duty vehicles (vehicles and trucks over 8,500 pounds gross vehicle weight), motorcycles, and off-road vehicles.
- For passenger cars, separate calculations are made for domestic (at least 75 percent U.S./Canada/Mexico content) and imported vehicles.

### **Standards**

- 1996-2003 CAFE standards are:

Domestic Pass Cars ( $\geq$ 75% U.S./Canada/Mexico content)	27.5 mpg
Import Passenger Cars	27.5 mpg
Light-Duty Trucks	20.7 mpg

### **Fines**

- Currently, fines are set at \$5.50 per tenth of mpg per vehicle produced. The fines are collected by NHTSA which can grant exemptions and alternative standards.
- Credits can be carried forward or back in time for up to three years to offset fines calculated in other years.
- A summary of fines collected and other information about CAFE can be found in NHTSA's Annual Report to Congress, at <http://www.nhtsa.dot.gov/cars/problems/studies/>

## **III. GAS GUZZLER TAX**

The Gas Guzzler Tax is imposed on manufacturers on the sale of new model year cars (not minivans, sport utility vehicles or pick-up trucks) whose fuel economy fails to meet certain statutory, to discourage the production and purchase of fuel inefficient vehicles. The fuel economy figures used to determine the tax are different from the fuel economy values provided in the Fuel Economy Guide. The tax is collected by the Internal Revenue Service and paid by the manufacturer. The amount of the tax is displayed on the vehicle's fuel economy label (the window sticker on new cars).

### **Calculation Technique**

- The Gas Guzzler Tax is based on the label calculation (i.e., the model type mpg values calculated at the beginning of the year based on projected sales)
- The combined fuel economy is used for determining tax liability. The fuel economy is not adjusted for in-use shortfall.
- The fuel economy is adjusted for differences in test procedures made since the base year, which typically increase the calculated average mpg value by 0.1 to 0.3 mpg..

### **Tax Schedule**

- The tax is collected by the IRS. The following table shows the gas guzzler tax rate which has been in effect since January 1, 1991:

at least 22.5 mpg	No tax
at least 21.5, but less than 22.5 mpg	\$1000
at least 20.5, but less than 21.5 mpg	\$1300
at least 19.5, but less than 20.5 mpg	\$1700
at least 18.5, but less than 19.5 mpg	\$2100
at least 17.5, but less than 18.5 mpg	\$2600
at least 16.5, but less than 17.5 mpg	\$3000
at least 15.5, but less than 16.5 mpg	\$3700
at least 14.5, but less than 15.5 mpg	\$4500
at least 13.5, but less than 14.5 mpg	\$5400
at least 12.5, but less than 13.5 mpg	\$6400
less than 12.5 mpg	\$7700

- The amount of the tax is shown on the fuel economy label (the window sticker on new cars).